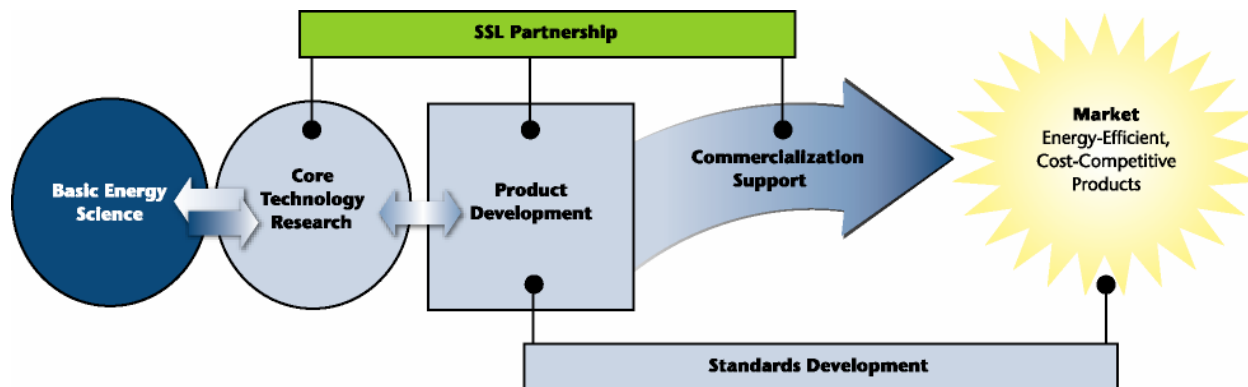


## Guiding Technology Advances from Laboratory to Marketplace

The U.S. Department of Energy's solid-state lighting (SSL) portfolio draws on the Department's long-term relationships with the SSL industry and research community to guide SSL technology from laboratory to marketplace. DOE's comprehensive approach includes Basic Energy Science, Core Technology Research, Product Development, Commercialization Support, Standards Development, and an SSL Partnership.

**Basic Research Advances Fundamental Understanding.** Projects conducted by the Basic Energy Sciences program focus on basic scientific questions that underlie DOE mission needs. These projects target principles of physics, chemistry, and the materials sciences, including knowledge of electronic and optical processes that enable development of new synthesis techniques and novel materials.

### DOE SOLID-STATE LIGHTING PORTFOLIO



- DOE's **Basic Energy Sciences** program conducts basic research to advance fundamental understanding of materials behavior. Project results often have multiple applications, including SSL.
- **Core Technology Research** projects focus on applied research for technology development, with particular emphasis on meeting efficiency, performance, and cost targets.
- **Product Development** projects focus on using the knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems.
- To ensure that these investments lead to SSL technology commercialization, DOE has drawn on its ongoing relationships with the SSL industry and research community to develop appropriate **Commercialization Support** strategies.
- In addition, DOE is working with the National Electrical Manufacturers Association (NEMA), the Next Generation Lighting Industry Alliance (NGLIA), and other standards setting organizations to accelerate the **Standards Development** process.
- The **SSL Partnership** provides input to enhance the manufacturing and commercialization focus of DOE's SSL portfolio.



U.S. Department of Energy

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**Core Technology Research Fills Knowledge Gaps.** Conducted primarily by academia, national laboratories, and research institutions, Core Technology Research involves scientific research efforts to seek more comprehensive knowledge or understanding about a subject. These projects fill technology gaps, provide enabling knowledge or data, and represent a significant advance in our knowledge base. They focus on applied research for technology development, with particular emphasis on meeting technical targets for performance and cost.

**Product Development Utilizes Knowledge Gains.** Conducted primarily by industry, Product Development is the systematic use of knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems. Technical activities focus on a targeted market application with fully defined price, efficacy, and other performance parameters necessary for the success of the proposed product. Project activities range from product concept modeling through development of test models and field-ready prototypes.

**Commercialization Support Activities Facilitate Market Readiness.** To ensure that DOE investments in Core Technology Research and Product Development lead to SSL technology commercialization, DOE has also developed a national strategy to guide market introduction of SSL for general illumination. Working with the SSL Partnership and other industry and energy organizations, DOE is implementing a full range of activities, including:

- ENERGY STAR® designation for SSL technologies and products
- Design competitions for lighting fixtures and systems using SSL
- Technical information resources on SSL technology issues, test procedures, and standards
- Testing of commercially available SSL products for general illumination
- Coordination with utility, regional, and national market transformation programs
- Technology procurement programs that encourage manufacturers to bring high-quality, energy-efficient SSL products to the market, and that link these products to volume buyers

**SSL Partnership Provides Manufacturing and Commercialization Focus.** Supporting the DOE SSL portfolio is the SSL Partnership between DOE and the NGLIA, an alliance of for-profit lighting manufacturers. DOE's Memorandum of Agreement with NGLIA, signed in 2005, details a strategy to enhance the manufacturing and commercialization focus of the DOE portfolio by utilizing the expertise of this organization of SSL manufacturers.

The SSL Partnership provides input to shape Core Technology Research priorities, and accelerates implementation of SSL technologies by:

- Communicating SSL program accomplishments
- Encouraging development of metrics, codes, and standards
- Promoting demonstration of SSL technologies for general lighting applications
- Supporting DOE voluntary market-oriented programs

**Standards Development Enables Meaningful Product Comparisons.** The development of national standards and rating systems for new products enables consumers to compare products made by different manufacturers, since all companies must test their products and apply the rating in the same way. No ratings or standards have yet been set for SSL products, but DOE is working closely with the Illuminating Engineering Society of North America, NEMA, NGLIA, and other standards setting organizations to accelerate development of needed standards and test procedures.